



*Business & Technology Consulting<sup>SM</sup>  
Education Solutions*

## Programming III: Advanced Techniques

**Course Length:** 3 days **CEUs** 1.8

**Format:** Hands on Training

### AUDIENCE

This course is designed to show SAS® programmers how to use the Data Step to read and manipulate complex forms of data, and how to use SAS utilities to manage SAS libraries.

### BENEFITS

You will learn to:

- Read any type of raw data into SAS
- Create information with ODS and multiple versions of data
- Perform complex merging and joining of data
- Work with data audit trails and complex, multidimensional arrays
- Set up data constraints
- Join summary and detail data

### PREREQUISITES

Programming II: Data Manipulation Using the Data Step and understand:

- Creating summary information, SAS functions, transforming data
- DROP, KEEP and RENAME processing
- Match merging and interleaving data
- Data step compile and execution
- Basic operating system commands and directory structures
- Libname statements

### COURSE TOPICS

Reading Data into SAS

- Reading all types of flat files and hierarchical data
- Reading mixed records formats
- Reading packed and zoned decimal data
- Working with EBCDIC and ASCII data
- Advance INFILE Statement options
- Setting up indexes in SAS
- Joining summary information with detail data

Data Utilities in SAS

- Viewing information with Data Step Views
- Outputting SAS data sets with ODS
- Using Generation Data Sets to create historical information

## Programming III: Advanced Techniques

### Understanding Data

- Working with Data Storage in SAS libraries
- Comparing data sets with Proc Compare

### Manipulating Data with Utility Procedures

- Using Proc Transpose to restructure data
- Using Proc Copy to copy data sets
- Using Proc Datasets to modify data set structure and attributes
- Using a single libref to reference all SAS libraries

### SAS Utilities to Manage Data

- Using the MODIFY statement to update data in place
- Data transformation
- Using Audit trails to track changes
- Using Arrays for repetitive calculations
- Setting up Integrity Constraints to maintain clean data

### Formatting Data for Better Presentations

- How to set up user defined formats
- How to use permanent formats
- How to set up dynamic formats with SAS data sets